

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
16 December 2004 (16.12.2004)

PCT

(10) International Publication Number
WO 2004/108926 A1

(51) International Patent Classification⁷: C12N 15/10,
15/11, 7/00

(21) International Application Number:
PCT/FI2004/000346

(22) International Filing Date: 7 June 2004 (07.06.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
20030854 6 June 2003 (06.06.2003) FI

(71) Applicant (for all designated States except US): RNA-
LINE OY [FI/FI]; Ylänkötie 20, FI-04430 Järvenpää (FI).

(72) Inventors; and

(75) Inventors/Applicants (for US only): MAKEYEV, Eu-
gene [RU/US]; c/o Maniatis Group, 7 Divinity Avenue, De-
partment of Molecular and Cellular Biology, Harvard Uni-
versity, Cambridge, MS 02138 (US). BAMFORD, Dennis
[FI/FI]; Ylänkötie 20, FI-04430 Järvenpää (FI).

(74) Agent: SEPPÖ LAINE OY; Itämerenkatu 3 B, FI-00180
Helsinki (FI).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI,
SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: METHODS AND KITS FOR PROPAGATING AND EVOLVING NUCLEIC ACIDS AND PROTEINS

(57) Abstract: A novel strategy for directed evolution of nucleic acids and proteins is described, in which target nucleic acid is copied by a polymerase devoid of proofreading function. Advantageous mutations generated during this process are recovered using an appropriate selection or screening procedure. The invention provides fast, inexpensive and non-laborious methods for practicing said strategy, which are utilized either separately or in combination with other methods for engineering biopolymers with desired properties. The invention furthermore provides kits for directed evolution according to the described methodology. In an aspect, the invention discloses methods and kits for producing nucleic acids encoding proteins with desired properties.

WO 2004/108926 A1